

To establish each identity, manipulate the left side of the equation only. Label which identity type used.

Simple Identities

1. $\csc \theta \cdot \cos \theta = \cot \theta$

2. $\cos \theta (\tan \theta + \sec \theta) = \sin \theta + 1$

3. $(\sec \theta + \tan \theta)(\sec \theta - \tan \theta) = 1$

4. $\sec \theta \cdot \sin \theta = \tan \theta$

5. $1 - \tan^2(-\theta) = \sec^2 \theta$

6. $\tan^2\left(\frac{\pi}{2} - \theta\right) + 1 = \csc^2 \theta$

Splitting fractions

7. $\frac{1+\cos^2 x}{\cos x} = \sec x + \cos x$

8. $\frac{\cos^2 \theta - \sin \theta}{\sin^2 \theta} = \cot^2 \theta - \csc \theta$

Splitting fractions (continued)

$$9. \frac{\cos^2 x + \csc x}{\sin^2 x} = \cot^2 x + \csc^3 x$$

$$10. \frac{\sec^2 \beta - \tan^2 \beta + \tan \beta}{\sec \beta} = \sin \beta + \cos \beta$$

Using Conjugates

$$11. \frac{\cos \theta}{1 + \sin \theta} = \sec \theta (1 - \sin \theta)$$

$$12. 1 - \frac{\sin^2 x}{1 - \cos x} = -\cos x$$